

TA-F448EB

SERVICE MANUAL

AEP Model
UK Model



SPECIFICATIONS

Amplifier section

DIN power output

85 W + 85 W (4 ohms at 1 kHz)
55 W + 55 W (8 ohms at 1 kHz)

Total harmonic distortion

Less than 0.008% (at 10 W output)

Frequency response

PHONO (20 Hz – 20 kHz): RIAA equalization curve ± 0.5 dB
TUNER, CD, AUX, TAPE1/DAT, TAPE2/MD: 7 Hz – 100 kHz ± 3 dB

S/N (network A)

PHONO: 94 dB
TUNER, CD, AUX, TAPE1/DAT, TAPE2/MD: 105 dB

Output voltage/impedance

RECOUT: 150 mV, 1 kilohm
PHONES: 10 mW (at 8 ohms)

Speakers impedance

4 – 16 ohms, 8 – 16 ohms (SPEAKERS A + B)

Damping factor

100 (8 ohms, 1 kHz)

General

System

Power amplifier: Pure-complementary SEPP OCL power amplifier with all stages directly coupled
Preamplifier: Low-noise, equalizer amplifier

Power requirements

230 V AC, 50/60 Hz

Power consumption

180 W

Dimensions (approx.) (w/h/d)

430 × 135 × 365 mm
incl. projecting parts and controls

Mass (approx.)

6.8 kg

Design and specifications are subject to change without notice.

INTEGRATED STEREO AMPLIFIER



SONY®

TABLE OF CONTENTS

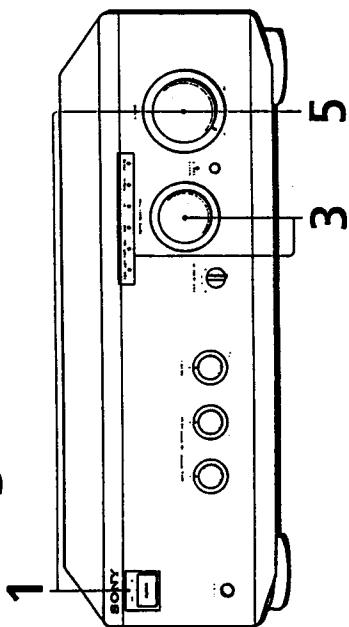
1. GENERAL	3
2. DISASSEMBLY	5
3. ELECTRICAL ADJUSTMENTS	7
4. DIAGRAMS	8
4-1. Printed Wiring Boards	10
4-2. Schematic Diagram	15
5. EXPLODED VIEWS	19
6. ELECTRICAL PARTS LIST	22

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Listening to the Music

Basic Operations



To listen through the headphones
Connect the headphones to
PHONES and set
SPEAKERS to OFF (TA-F448EB only).

To listen directly to the input signal (TA-F448E only)
Press SOURCE DIRECT so
that the indicator lights up.
Since the circuits of TONE
controls and BALANCE
control are bypassed, you
cannot adjust bass, treble, or
the balance while listening
to a source directly.

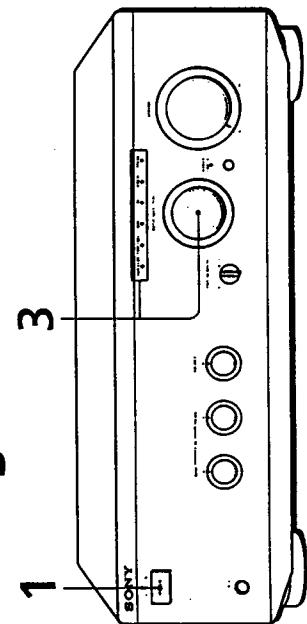
Note
Avoid high speaker output at
which the sound is distorted.
High-frequency distortion may
damage the tweeters.

- 1 Press POWER to turn on the amplifier and turn VOLUME fully counter-clockwise to prevent damaging the speakers with excessive output.
The PROTECTION indicator lights up; then goes off.
- 2 Turn on the programme source you want to listen to.

- 3 Set INPUT SELECTOR to the respective programme source.
The indicator for the programme source lights up.
To listen to a Turn INPUT SELECTOR for
Record PHONO
Radio broadcast TUNER
Compact disc CD
Source connected to AUX AUX
- 4 Start the programme source.

This section is extracted
from instruction manual.

Recording



You can record the same source on two recording components at the same time

You can monitor the recorded sound
If you record on a tape deck
which has separate playback
and recording heads, you
can monitor the recorded
sound. To monitor the
sound, set TAPE MONITOR
to TAPE1 or TAPE2.

- 1 Press POWER to turn on the amplifier. The PROTECTION indicator lights up; then goes off.

- 2 Turn on the programme source you want to record.

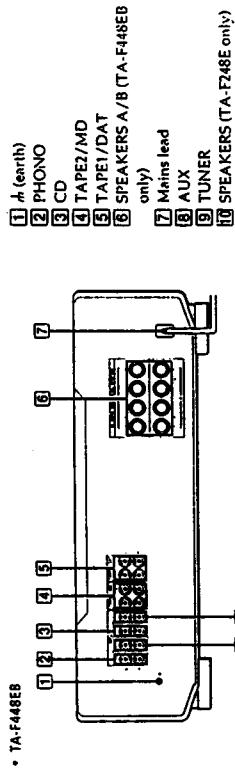
- 3 Select the programme source that you want to record by turning INPUT SELECTOR.
The indicator for the programme source lights up.

To record a	Set INPUT SELECTOR to
Record	PHONO
Radio broadcast	TUNER
Compact disc	CD
Source connected to AUX	AUX

- 4 Prepare the recording component for recording, then start recording.

- 5 Start playing the programme source.

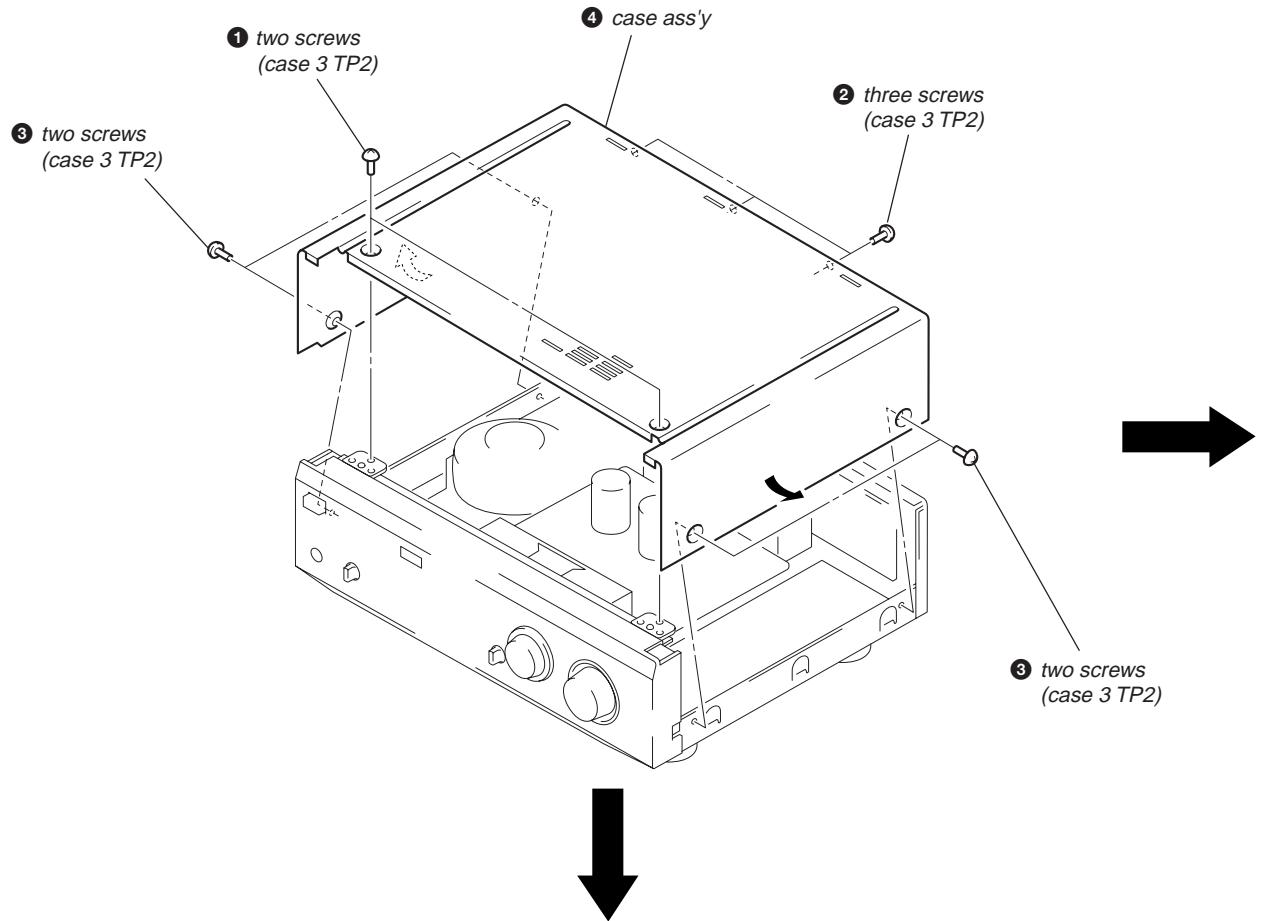
Rear Panel Descriptions



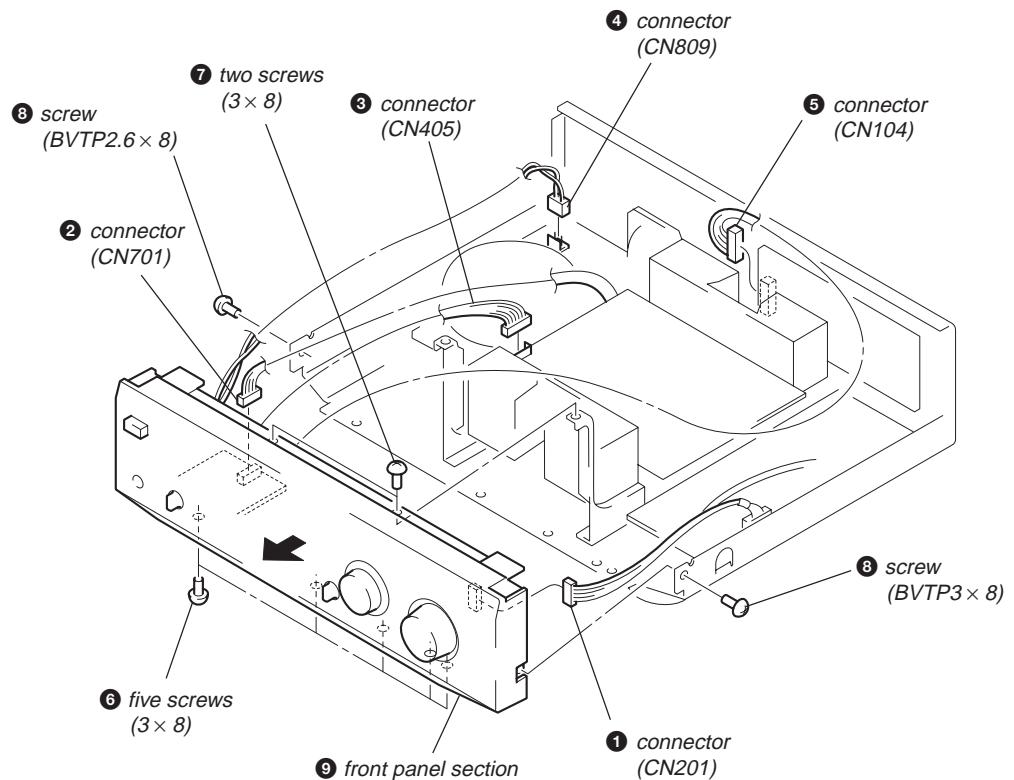
SECTION 2 DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

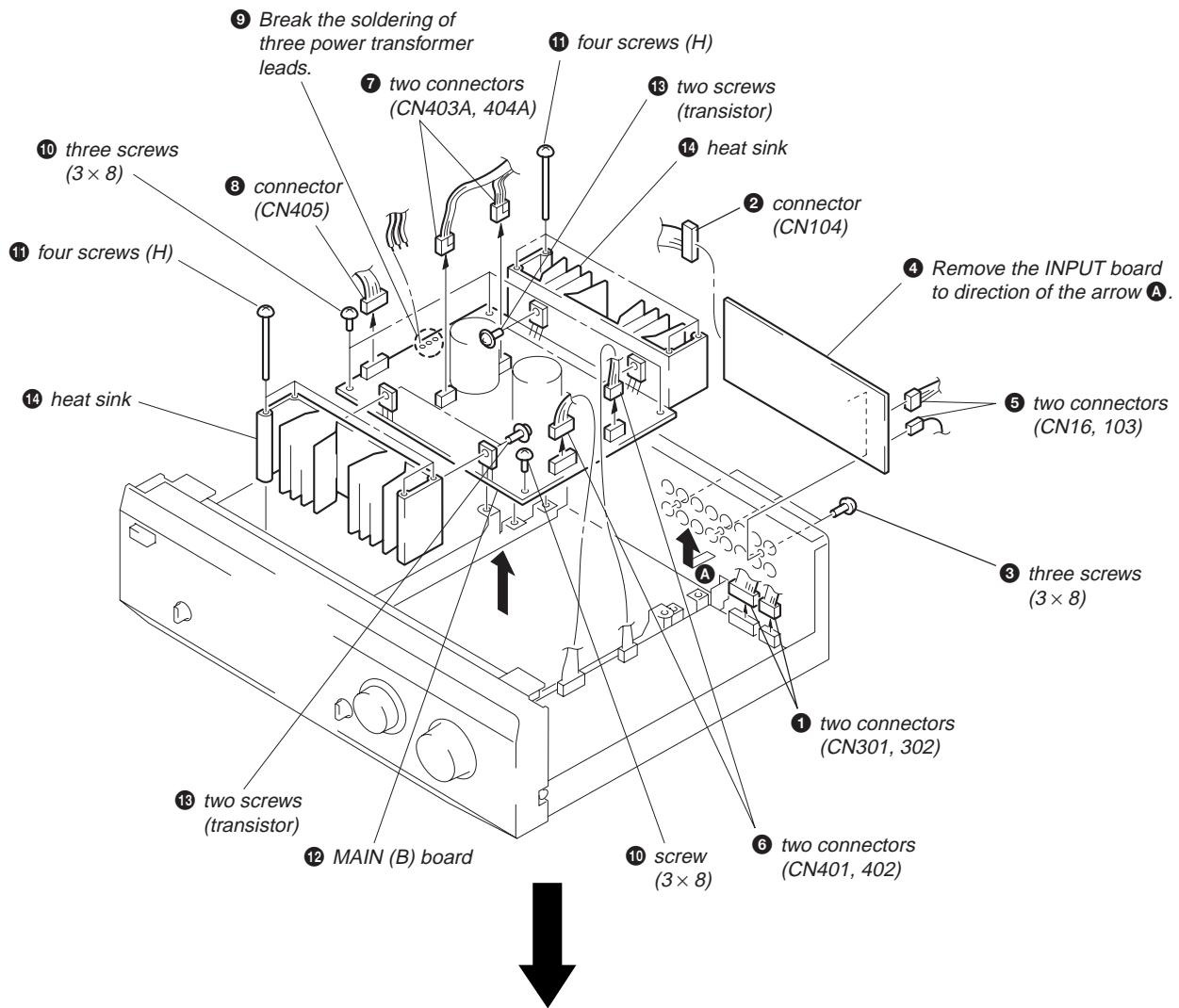
CASE ASS'Y



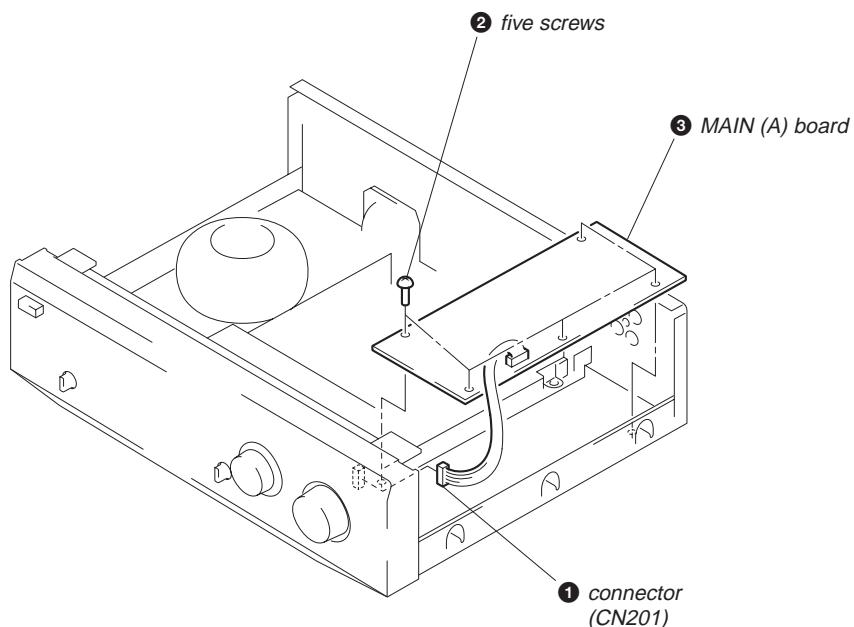
FRONT PANEL SECTION



INPUT BAORD, MAIN (B) BAORD



MAIN (A) BOARD



SECTION 3

ELECTRICAL ADJUSTMENT

BIAS ADJUSTMENT

Adjustment Procedure:

1. Rotate fully the bias adjusting semi-fixed resistors (RV301 (L-CH), RV351 (R-CH)) to the minimum position (counterclockwise).
2. Connect a digital voltmeter to the CN406 (L-CH) and CN407 (R-CH).

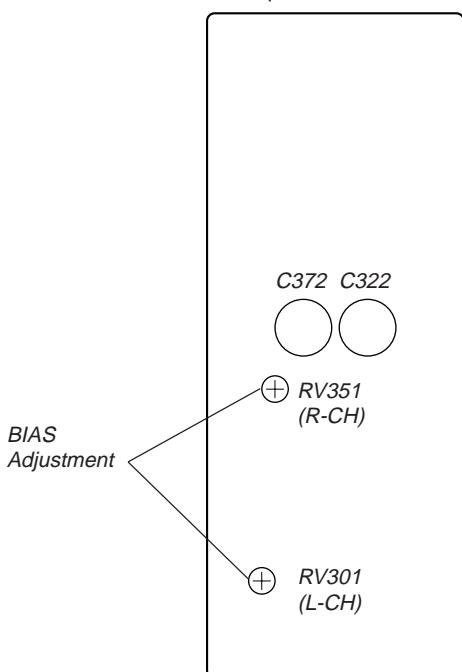
	pin ①	pin ③
CN406 (L-CH)	-	+
CN407 (R-CH)	+	-

3. Set the slidack to 0 V AC, and press the [POWER] button (ON) on the set.
4. Raise gradually the slidack voltage up to the rated voltage (230 V AC).
5. At this time, confirm that the speaker relay is turned on (it will click).
6. Adjust the RV301 (L-CH) and RV351 (R-CH) so that a reading of digital voltmeter is from 10 mV to 20 mV.
7. Return the slidack to 0 V AC, and press the [POWER] button (OFF) on the set.

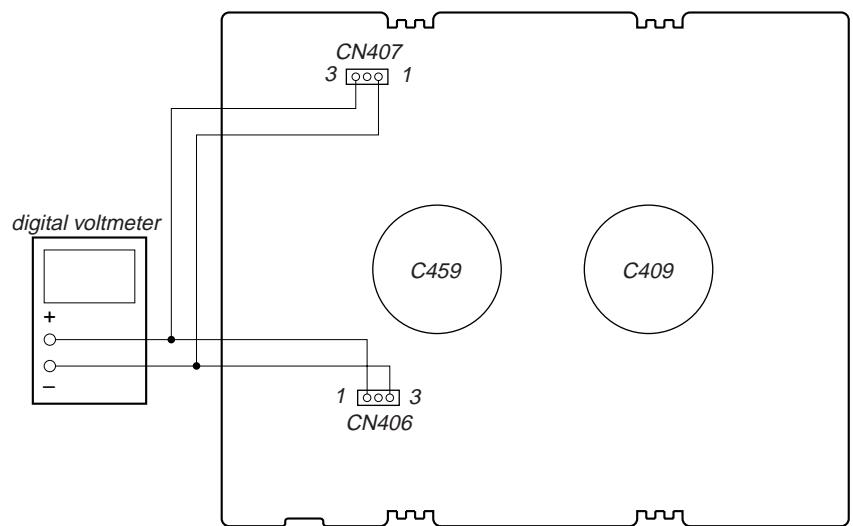
Connection and Adjustment Location:

[MAIN (A) BOARD]

– Component side –



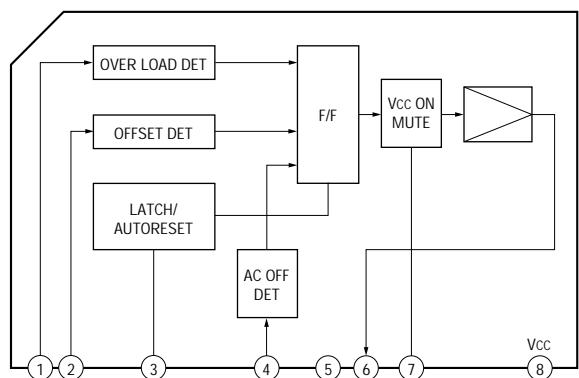
[MAIN (B) BOARD] – Component side –



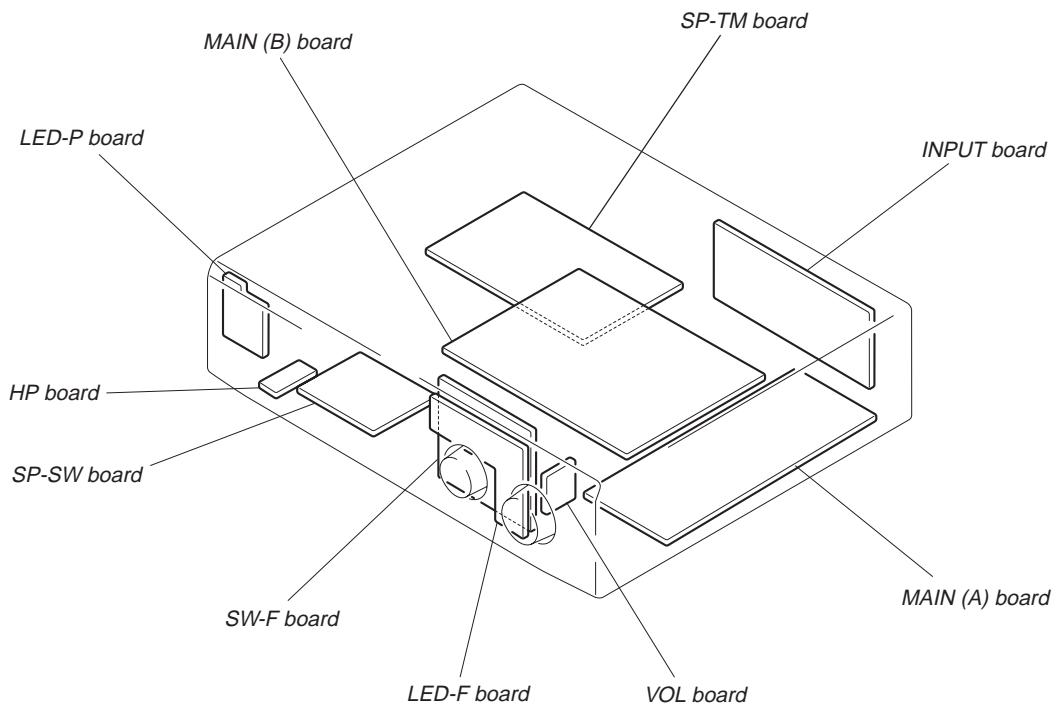
SECTION 4 DIAGRAMS

- IC Block Diagram

IC401 μPC1237HA



• Circuit Boards Location

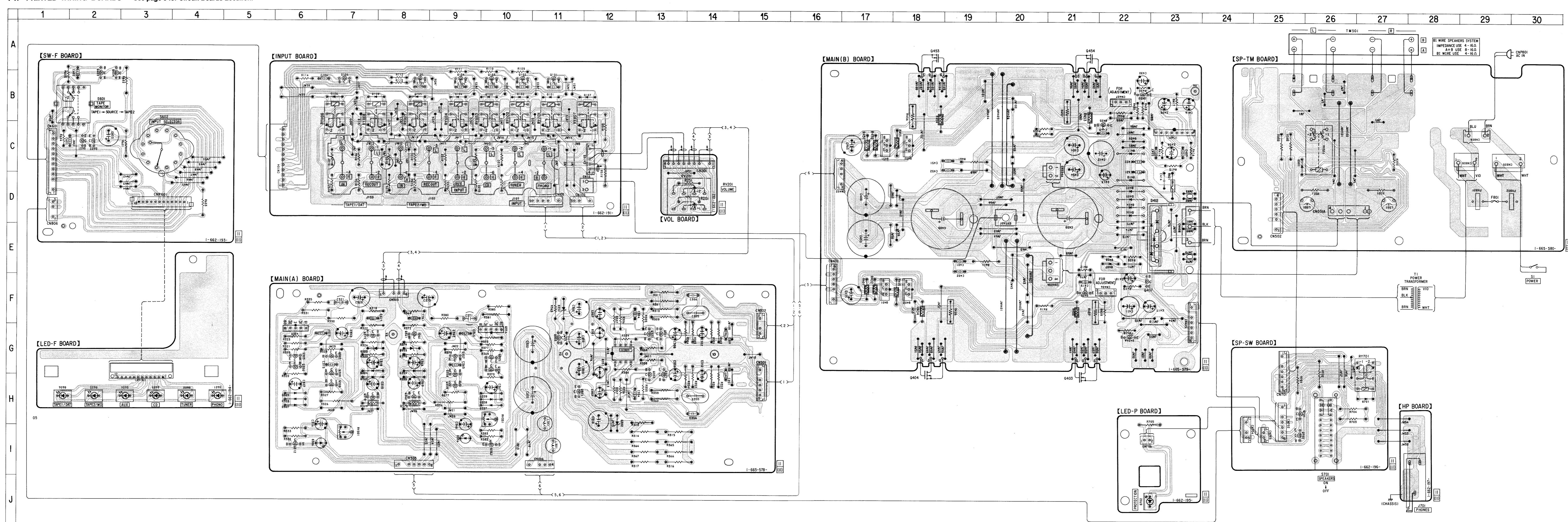


4-1. PRINTED WIRING BOARDS • See page 9 for Circuit Boards Location.

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D101	B-11	Q101	B-11
D102	B-10	Q102	B-10
D103	B-10	Q103	B-9
D104	B-9	Q104	B-9
D105	B-8	Q105	B-7
D106	B-7	Q106	G-13
D107	B-12	Q301	G-13
D108	B-8	Q302	G-6
D301	H-12	Q303	H-11
D302	G-7	Q304	G-6
D303	G-7	Q305	G-6
D304	H-7	Q306	G-6
D305	I-6	Q307	G-7
D306	H-6	Q308	G-7
D307	H-6	Q309	H-7
D308	H-6	Q310	H-7
D309	G-12	Q311	G-7
D351	F-11	Q351	G-13
D352	G-8	Q352	G-13
D353	G-8	Q353	G-11
D354	H-8	Q354	G-10
D355	I-9	Q355	G-10
D356	H-10	Q356	G-10
D357	H-10	Q357	G-9
D358	H-10	Q358	G-9
D403	D-22	Q359	H-9
D404	D-22	Q360	H-8
D405	D-22	Q361	G-8
D406	D-22	Q362	I-10
D407	E-22	Q401	F-17
D408	E-22	Q402	F-18
D409	C-22	Q403	G-21
D410	D-22	Q404	G-18
D411	C-22	Q405	F-21
D412	D-23	Q406A	G-22
D501	C-25	Q407	F-22
D601	H-4	Q430	B-22
D602	H-4	Q451	C-17
D603	H-3	Q452	C-18
D604	H-3	Q453	A-18
D605	H-2	Q454	A-21
D606	H-1	Q455	B-22
D701	H-27	Q601	C-2
D702	J-23	Q602	B-2
IC301	G-12	Q603	B-2
IC401	C-23	Q604	H-25
		Q701	I-25
		Q702	

Note on Printed Wiring Board:
 • : parts extracted from the component side.
 • : Pattern from the side which enables seeing.



SECTION 5 EXPLODED VIEWS

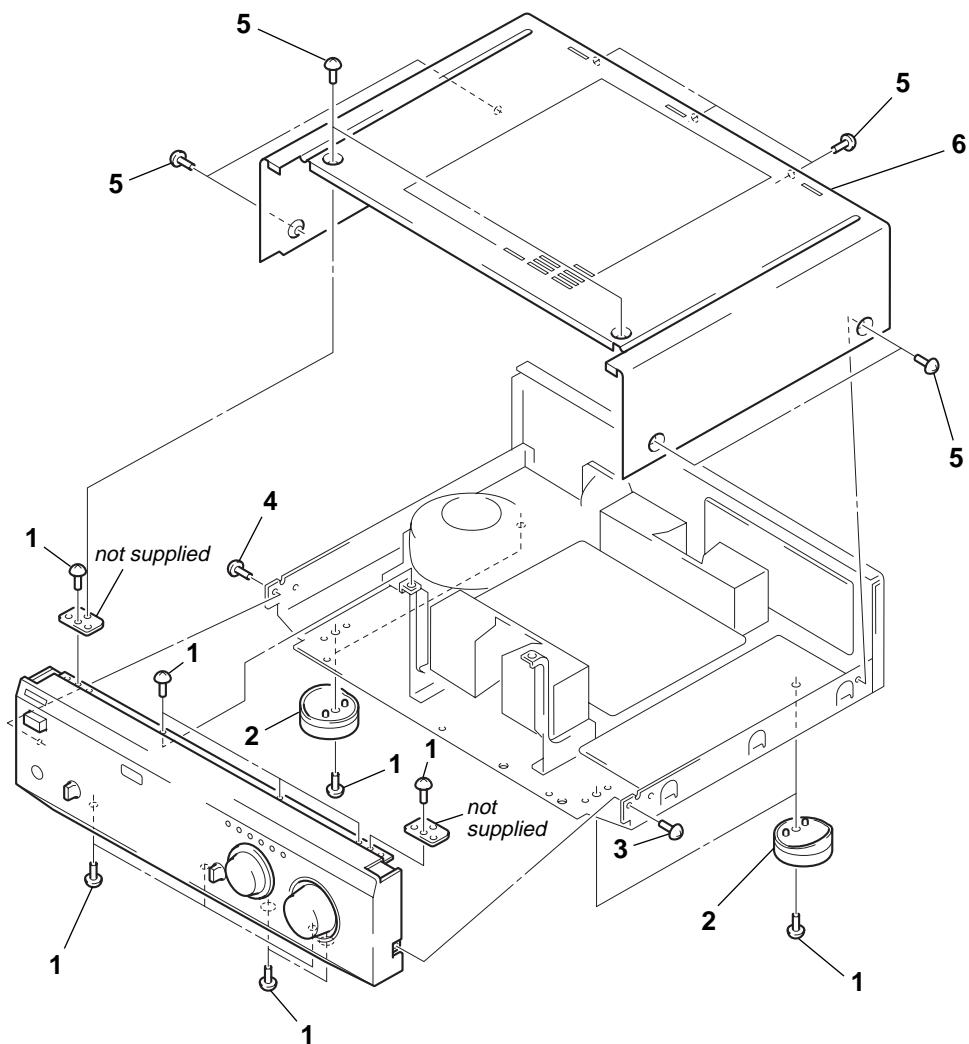
NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) . . . (RED)
 ↑ ↑
Parts Color Cabinet's Color

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

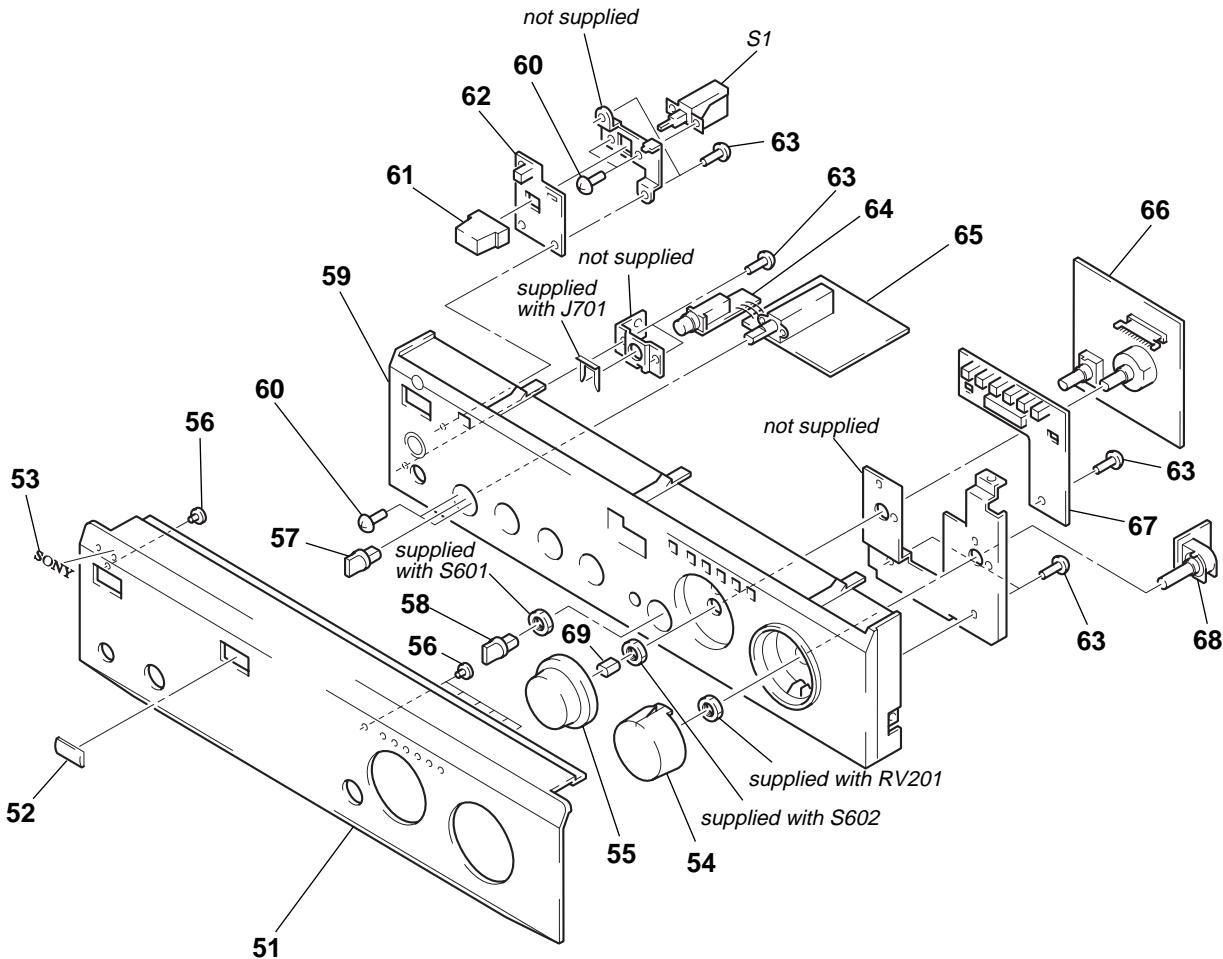
The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

(1) CASE SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-967-961-01	SCREW (3X8)		4	4-951-620-01	SCREW (2.6X8), +BVTP	
2	X-4947-025-1	FOOT ASSY		5	3-363-099-61	SCREW (CASE 3 TP2)	
3	7-685-872-09	SCREW +BVTT 3X8 (S)		6	X-4948-403-1	CASE ASSY	

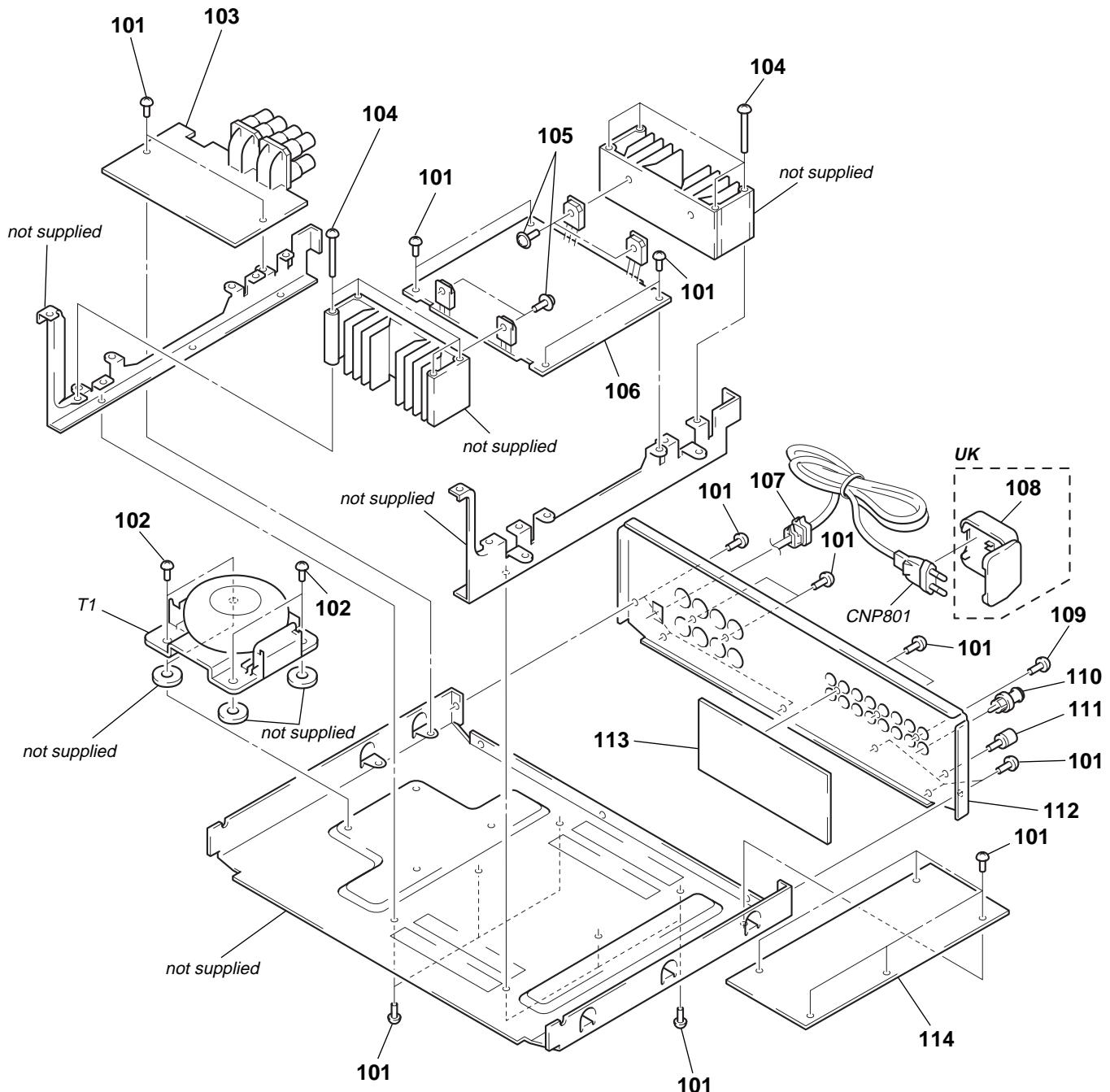
(2) FRONT PANEL SECTION



The components identified by mark ▲ or dotted line with mark ▲ are critical for safety.
Replace only with part number specified.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
51	4-980-767-12	PANEL, FRONT		61	4-980-199-01	BUTTON (POWER)	
52	4-965-651-01	EMBLEM (MOS)		* 62	1-662-195-11	LED-P BOARD	
53	4-979-587-01	EMBLEM (NO.5), SONY		63	4-951-620-01	SCREW (2.6X8), +BVTP	
54	X-4946-920-1	KNOB (VOL) ASSY		* 64	1-662-197-11	HP BOARD	
55	4-980-771-01	KNOB (DIA. 47)		* 65	1-662-196-11	SP-SW BOARD	
56	4-980-775-01	LENS, LED		* 66	1-662-193-11	SW-F BOARD	
57	4-980-774-11	KNOB (F11)		* 67	1-662-194-11	LED-F BOARD	
58	4-980-774-01	KNOB (F11)		* 68	1-662-192-11	VOL BOARD	
59	X-4946-944-1	PANEL ASSY, BASE		69	3-703-466-00	SPRING (6600)	
60	7-685-872-09	SCREW +BVTP 3X8 (S)		△ S1	1-554-920-11	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)	

(3) CHASSIS SECTION



The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	4-967-961-01	SCREW (3X8)		110	1-506-113-00	SHORT PLUG	
102	4-967-960-01	SCREW (4X8)		111	4-947-010-01	SCREED, FEEDER FIXED	
* 103	1-665-580-11	SP-TM BOARD		* 112	4-982-978-21	PANEL, BACK (AEP)	
104	4-981-016-11	SCREW (H)		* 112	4-982-978-31	PANEL, BACK (UK)	
105	3-905-609-11	SCREW (TRANSISTOR)		* 113	1-662-191-11	INPUT BOARD	
* 106	A-4398-160-A	MAIN (B) BOARD, COMPLETE		* 114	A-4398-159-A	MAIN (A) BOARD, COMPLETE	
* 107	3-703-244-00	BUSHING (2104), CORD		△ CNP801	1-777-185-11	CORD, POWER	
△ 108	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)		△ T1	1-431-295-11	TRANSFORMER, POWER	
109	3-704-515-41	SCREW (BV/RING)					

HP

INPUT

LED-F

SECTION 6

ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- SEMICONDUCTORS

In each case, u: μ , for example:

uA... : μ A... uPA... : μ PA...

uPB... : μ PB... uPC... : μ PC...

uPD... : μ PD...

- CAPACITORS

uF: μ F

- COILS

uH: μ H

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description					Remark	Ref. No.	Part No.	Description					Remark
*	1-662-197-11	HP BOARD	*****					Q106	8-729-119-78	TRANSISTOR	2SC2785-HFE				
< JACK >															
J701 1-750-735-11 JACK (LARGE TYPE) (PHONES)															
*	1-662-191-11	INPUT BOARD	*****					R101	1-259-500-11	CARBON	1M	5%	1/6W		
< CAPACITOR >															
C101	1-136-165-00	FILM	0.1uF	5%	50V			R102	1-259-500-11	CARBON	1M	5%	1/6W		
C102	1-136-165-00	FILM	0.1uF	5%	50V			R103	1-259-500-11	CARBON	1M	5%	1/6W		
C103	1-136-165-00	FILM	0.1uF	5%	50V			R104	1-259-428-11	CARBON	1K	5%	1/6W		
C104	1-136-165-00	FILM	0.1uF	5%	50V			R105	1-259-500-11	CARBON	1M	5%	1/6W		
C105	1-136-165-00	FILM	0.1uF	5%	50V			R106	1-259-428-11	CARBON	1K	5%	1/6W		
C106	1-136-165-00	FILM	0.1uF	5%	50V			R107	1-259-500-11	CARBON	1M	5%	1/6W		
< CONNECTOR >															
CN16	1-564-320-00	PIN, CONNECTOR (B2P-VH) 2P						R108	1-249-210-11	CARBON	1K	5%	1/3W		
CN103	1-691-766-11	PLUG (MICRO CONNECTOR) 4P						R109	1-259-444-11	CARBON	4.7K	5%	1/6W		
* CN104	1-564-527-11	PLUG, CONNECTOR 12P						R110	1-259-444-11	CARBON	4.7K	5%	1/6W		
< DIODE >															
D101	8-719-987-63	DIODE	1N4148M					R111	1-259-444-11	CARBON	4.7K	5%	1/6W		
D102	8-719-987-63	DIODE	1N4148M					R112	1-259-444-11	CARBON	4.7K	5%	1/6W		
D103	8-719-987-63	DIODE	1N4148M					R113	1-259-444-11	CARBON	4.7K	5%	1/6W		
D104	8-719-987-63	DIODE	1N4148M					R114	1-259-444-11	CARBON	4.7K	5%	1/6W		
D105	8-719-987-63	DIODE	1N4148M					R115	1-259-500-11	CARBON	1M	5%	1/6W		
D106	8-719-987-63	DIODE	1N4148M					R116	1-259-500-11	CARBON	1M	5%	1/6W		
D107	8-719-987-63	DIODE	1N4148M					R117	1-259-500-11	CARBON	1M	5%	1/6W		
D108	8-719-987-63	DIODE	1N4148M					R118	1-249-210-11	CARBON	1K	5%	1/3W		
< PIN JACK >															
J101	1-568-978-51	JACK 6P (PHONO/TUNER/CD INPUT)						< RELAY >							
J102	1-568-978-11	JACK 6P (AUX INPUT, TAPE2/MD IN/RECOUT)						RY101	1-515-614-11	RELAY					
* J103	1-573-142-21	JACK, PIN 4P (TAPE1/DAT IN/RECOUT)						RY102	1-515-614-11	RELAY					
< TRANSISTOR >															
Q101	8-729-119-78	TRANSISTOR	2SC2785-HFE					RY103	1-515-614-11	RELAY					
Q102	8-729-119-78	TRANSISTOR	2SC2785-HFE					RY104	1-515-614-11	RELAY					
Q103	8-729-119-78	TRANSISTOR	2SC2785-HFE					RY105	1-515-614-11	RELAY					
Q104	8-729-119-78	TRANSISTOR	2SC2785-HFE					RY106	1-515-614-11	RELAY					
Q105	8-729-119-78	TRANSISTOR	2SC2785-HFE					RY107	1-515-622-11	RELAY					
< CONNECTOR >															
CNJ601	1-766-796-11	CONNECTOR, BOARD TO BOARD 12P													

*															
1-662-194-11 LED-F BOARD															

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< DIODE >							
D601	8-719-313-50	LED SEL6810A-TH12 (PHONO)		C368	1-126-023-11	ELECT	100uF 20% 16V
D602	8-719-313-50	LED SEL6810A-TH12 (TUNER)		C369	1-126-023-11	ELECT	100uF 20% 16V
D603	8-719-313-50	LED SEL6810A-TH12 (CD)		C370	1-110-393-11	ELECT	100uF 20% 63V
D604	8-719-313-50	LED SEL6810A-TH12 (AUX)		C371	1-113-496-11	POLYSTYRENE	4PF 10% 50V
D605	8-719-313-50	LED SEL6810A-TH12 (TAPE2/MD)		C372	1-109-871-11	ELECT	2700uF 20% 50V
< CONNECTOR >							
D606	8-719-313-50	LED SEL6810A-TH12 (TAPE1/DAT)		CN301	1-691-767-11	PLUG (MICRO CONNECTOR) 5P	

*	1-662-195-11	LED-P BOARD	*****	CN302	1-691-765-11	PLUG (MICRO CONNECTOR) 3P	
< DIODE >							
D702	8-719-313-48	LED SEL6210S-TH12 (PROTECTON)		D301	8-719-310-61	LED SEL1510C-D	
< RESISTOR >							
R705	1-259-143-21	CARBON	100 5% 1/4W	D302	8-719-933-88	DIODE HZS16-2L	

*	A-4398-159-A	MAIN (A) BOARD, COMPLETE	*****	D303	8-719-933-41	DIODE HZS6C3L	
< CAPACITOR >							
C301	1-102-978-00	CERAMIC	220PF 5% 50V	D304	8-719-987-63	DIODE 1N4148M	
C302	1-126-059-11	ELECT	10uF 20% 50V	D305	8-719-987-63	DIODE 1N4148M	
C304	1-106-359-00	MYLAR	4700PF 5% 200V	D306	8-719-310-61	LED SEL1510C-D	
C305	1-130-341-00	FILM	0.056uF 3% 100V	D307	8-719-987-63	DIODE 1N4148M	
C306	1-130-971-00	FILM	0.016uF 3% 100V	D308	8-719-987-63	DIODE 1N4148M	
C307	1-126-059-11	ELECT	10uF 20% 50V	D309	8-719-987-63	DIODE 1N4148M	
C308	1-126-022-11	ELECT	47uF 20% 25V	D310	8-719-310-61	LED SEL1510C-D	
C309	1-126-025-11	ELECT	330uF 20% 25V	D311	8-719-987-63	DIODE 1N4148M	
C310	1-126-023-11	ELECT	100uF 20% 25V	D312	8-719-987-63	DIODE 1N4148M	
C311	1-102-973-00	CERAMIC	100PF 5% 50V	D313	8-719-290-11	POLYSTYRENE	330PF 5% 50V
C312	1-124-721-11	ELECT	10uF 20% 50V	D314	1-102-230-00	CERAMIC	4PF 0.25PF 500V
C313	1-104-290-11	POLYSTYRENE	330PF 5% 50V	D315	1-126-023-11	ELECT	100uF 20% 16V
C315	1-102-230-00	CERAMIC	4PF 0.25PF 500V	D316	1-126-023-11	ELECT	100uF 20% 16V
C316	1-126-023-11	ELECT	100uF 20% 16V	D317	1-126-023-11	ELECT	100uF 20% 16V
C317	1-126-023-11	ELECT	100uF 20% 16V	D318	1-126-023-11	ELECT	100uF 20% 16V
C318	1-126-023-11	ELECT	100uF 20% 16V	C319	1-126-023-11	ELECT	100uF 20% 16V
C319	1-126-023-11	ELECT	100uF 20% 16V	C320	1-110-393-11	ELECT	100uF 20% 63V
C320	1-110-393-11	ELECT	100uF 20% 63V	C321	1-113-496-11	POLYSTYRENE	4PF 10% 50V
C321	1-113-496-11	POLYSTYRENE	4PF 10% 50V	C322	1-109-871-11	ELECT	2700uF 20% 50V
C322	1-109-871-11	ELECT	2700uF 20% 50V	C323	1-102-978-00	CERAMIC	220PF 5% 50V
C323	1-102-978-00	CERAMIC	220PF 5% 50V	C324	1-126-059-11	ELECT	10uF 20% 50V
C324	1-126-059-11	ELECT	10uF 20% 50V	C325	1-106-359-00	MYLAR	4700PF 5% 200V
C325	1-106-359-00	MYLAR	4700PF 5% 200V	C326	1-130-341-00	FILM	0.056uF 3% 100V
C326	1-130-341-00	FILM	0.056uF 3% 100V	C327	1-130-971-00	FILM	0.016uF 3% 100V
C327	1-130-971-00	FILM	0.016uF 3% 100V	C328	1-126-059-11	ELECT	10uF 20% 50V
C328	1-126-059-11	ELECT	10uF 20% 50V	C329	1-126-022-11	ELECT	47uF 20% 25V
C329	1-126-022-11	ELECT	47uF 20% 25V	C330	1-126-025-11	ELECT	330uF 20% 25V
C330	1-126-025-11	ELECT	330uF 20% 25V	C331	1-126-023-11	ELECT	100uF 20% 25V
C331	1-126-023-11	ELECT	100uF 20% 25V	C332	1-102-973-00	CERAMIC	100PF 5% 50V
C332	1-102-973-00	CERAMIC	100PF 5% 50V	C333	1-126-059-11	ELECT	10uF 20% 50V
C333	1-126-059-11	ELECT	10uF 20% 50V	C334	1-124-721-11	ELECT	10uF 20% 50V
C334	1-124-721-11	ELECT	10uF 20% 50V	C335	1-104-290-11	POLYSTYRENE	330PF 5% 50V
C335	1-104-290-11	POLYSTYRENE	330PF 5% 50V	C336	1-102-230-00	CERAMIC	4PF 0.25PF 500V
C336	1-102-230-00	CERAMIC	4PF 0.25PF 500V	C337	1-126-023-11	ELECT	100uF 20% 16V
C337	1-126-023-11	ELECT	100uF 20% 16V	C338	1-126-023-11	ELECT	100uF 20% 16V
C338	1-126-023-11	ELECT	100uF 20% 16V	C339	1-126-023-11	ELECT	100uF 20% 16V
C339	1-126-023-11	ELECT	100uF 20% 16V	C340	1-110-393-11	ELECT	100uF 20% 63V
C340	1-110-393-11	ELECT	100uF 20% 63V	C341	1-113-496-11	POLYSTYRENE	4PF 10% 50V
C341	1-113-496-11	POLYSTYRENE	4PF 10% 50V	C342	1-109-871-11	ELECT	2700uF 20% 50V
C342	1-109-871-11	ELECT	2700uF 20% 50V	C343	1-102-978-00	CERAMIC	220PF 5% 50V
C343	1-102-978-00	CERAMIC	220PF 5% 50V	C344	1-126-059-11	ELECT	10uF 20% 50V
C344	1-126-059-11	ELECT	10uF 20% 50V	C345	1-126-022-11	ELECT	47uF 20% 25V
C345	1-126-022-11	ELECT	47uF 20% 25V	C346	1-126-025-11	ELECT	330uF 20% 25V
C346	1-126-025-11	ELECT	330uF 20% 25V	C347	1-126-023-11	ELECT	100uF 20% 25V
C347	1-126-023-11	ELECT	100uF 20% 25V	C348	1-102-973-00	CERAMIC	100PF 5% 50V
C348	1-102-973-00	CERAMIC	100PF 5% 50V	C349	1-126-059-11	ELECT	10uF 20% 50V
C349	1-126-059-11	ELECT	10uF 20% 50V	C350	1-124-721-11	ELECT	10uF 20% 50V
C350	1-124-721-11	ELECT	10uF 20% 50V	C351	1-104-290-11	POLYSTYRENE	330PF 5% 50V
C351	1-104-290-11	POLYSTYRENE	330PF 5% 50V	C352	1-102-230-00	CERAMIC	4PF 0.25PF 500V
C352	1-102-230-00	CERAMIC	4PF 0.25PF 500V	C353	1-126-023-11	ELECT	100uF 20% 16V
C353	1-126-023-11	ELECT	100uF 20% 16V	C354	1-126-059-11	ELECT	10uF 20% 50V
C354	1-126-059-11	ELECT	10uF 20% 50V	C355	1-126-022-11	ELECT	47uF 20% 25V
C355	1-126-022-11	ELECT	47uF 20% 25V	C356	1-126-025-11	ELECT	330uF 20% 25V
C356	1-126-025-11	ELECT	330uF 20% 25V	C357	1-126-023-11	ELECT	100uF 20% 25V
C357	1-126-023-11	ELECT	100uF 20% 25V	C358	1-102-973-00	CERAMIC	100PF 5% 50V
C358	1-102-973-00	CERAMIC	100PF 5% 50V	C359	1-126-059-11	ELECT	10uF 20% 50V
C359	1-126-059-11	ELECT	10uF 20% 50V	C360	1-124-721-11	ELECT	10uF 20% 50V
C360	1-124-721-11	ELECT	10uF 20% 50V	C361	1-104-290-11	POLYSTYRENE	330PF 5% 50V
C361	1-104-290-11	POLYSTYRENE	330PF 5% 50V	C362	1-102-230-00	CERAMIC	4PF 0.25PF 500V
C362	1-102-230-00	CERAMIC	4PF 0.25PF 500V	C363	1-126-023-11	ELECT	100uF 20% 16V
C363	1-126-023-11	ELECT	100uF 20% 16V	C364	1-126-059-11	ELECT	10uF 20% 50V
C364	1-126-059-11	ELECT	10uF 20% 50V	C365	1-126-022-11	ELECT	47uF 20% 25V
C365	1-126-022-11	ELECT	47uF 20% 25V	C366	1-126-025-11	ELECT	330uF 20% 25V
C366	1-126-025-11	ELECT	330uF 20% 25V	C367	1-126-023-11	ELECT	100uF 20% 25V
C367	1-126-023-11	ELECT	100uF 20% 25V	C368	1-110-393-11	ELECT	2700uF 20% 50V
C368	1-110-393-11	ELECT	2700uF 20% 50V	C369	1-113-496-11	POLYSTYRENE	4PF 10% 50V
C369	1-113-496-11	POLYSTYRENE	4PF 10% 50V	C370	1-109-871-11	ELECT	100uF 20% 16V
C370	1-109-871-11	ELECT	100uF 20% 16V	C371	1-126-059-11	ELECT	10uF 20% 50V
C371	1-126-059-11	ELECT	10uF 20% 50V	C372	1-126-022-11	ELECT	47uF 20% 25V
C372	1-126-022-11	ELECT	47uF 20% 25V	C373	1-126-025-11	ELECT	330uF 20% 25V
C373	1-126-025-11	ELECT	330uF 20% 25V	C374	1-126-023-11	ELECT	100uF 20% 25V
C374	1-126-023-11	ELECT	100uF 20% 25V	C375	1-102-973-00	CERAMIC	100PF 5% 50V
C375	1-102-973-00	CERAMIC	100PF 5% 50V	C376	1-126-059-11	ELECT	10uF 20% 50V
C376	1-126-059-11	ELECT	10uF 20% 50V	C377	1-126-022-11	ELECT	47uF 20% 25V
C377	1-126-022-11	ELECT	47uF 20% 25V	C378	1-126-025-11	ELECT	330uF 20% 25V
C378	1-126-025-11	ELECT	330uF 20% 25V	C379	1-126-023-11	ELECT	100uF 20% 25V
C379	1-126-023-11	ELECT	100uF 20% 25V	C380	1-102-973-00	CERAMIC	100PF 5% 50V
C380	1-102-973-00	CERAMIC	100PF 5% 50V	C381	1-126-059-11	ELECT	10uF 20% 50V
C381	1-126-059-11	ELECT	10uF 20% 50V	C382	1-126-022-11	ELECT	47uF 20% 25V
C382	1-126-022-11	ELECT	47uF 20% 25V	C383	1-126-025-11	ELECT	330uF 20% 25V
C383	1-126-025-11	ELECT	330uF 20% 25V	C384	1-126-023-11	ELECT	100uF 20% 25V
C384	1-126-023-11	ELECT	100uF 20% 25V	C385	1-102-973-00	CERAMIC	100PF 5% 50V
C385	1-102-973-00	CERAMIC	100PF 5% 50V	C386	1-126-059-11	ELECT	10uF 20% 50V
C386	1-126-059-11	ELECT	10uF 20% 50V	C387	1-126-022-11	ELECT	47uF 20% 25V
C387	1-126-022-11	ELECT	47uF 20% 25V	C388	1-126-025-11	ELECT	330uF 20% 25V
C388	1-126-025-11	ELECT	330uF 20% 25V	C389	1-126-023-11	ELECT	100uF 20% 25V
C389	1-126-023-11	ELECT	100uF 20% 25V	C390	1-102-973-00	CERAMIC	100PF 5% 50V
C390	1-102-973-00	CERAMIC	100PF 5% 50V	C391	1-126-059-11	ELECT	10uF 20% 50V
C391	1-126-059-11	ELECT	10uF 20% 50V	C392	1-126-022-11	ELECT	47uF 20% 25V
C392	1-126-022-11	ELECT	47uF 20% 25V	C393	1-126-025-11	ELECT	330uF 20% 25V
C393	1-126-025-11						

MAIN (A)

MAIN (B)

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark	
Q359	8-729-202-67	FET	2SK246-GR3	R365	1-249-198-11	CARBON	330 5% 1/3W	
Q360	8-729-021-73	TRANSISTOR	2SC2229-OY-TPE6	R366	1-249-198-11	CARBON	330 5% 1/3W	
Q361	8-729-281-54	TRANSISTOR	2SC1815-BL	R367	1-249-198-11	CARBON	330 5% 1/3W	
Q362	8-729-281-54	TRANSISTOR	2SC1815-BL	R368	1-259-167-21	CARBON	1K 5% 1/4W	
< RESISTOR >				R369	1-259-151-21	CARBON	220 5% 1/4W	
R301	1-259-215-21	CARBON	100K 5% 1/4W	R370	1-259-151-21	CARBON	220 5% 1/4W	
R302	1-249-911-11	CARBON	330 5% 1/4W	R371	1-259-151-21	CARBON	220 5% 1/4W	
R303	1-259-215-21	CARBON	100K 5% 1/4W	R372	1-259-215-21	CARBON	100K 5% 1/4W	
R304	1-249-900-11	CARBON	110 1% 1/4W	R373	1-259-179-21	CARBON	3.3K 5% 1/4W	
R305	1-259-161-21	CARBON	560 5% 1/4W	R374	1-259-175-11	CARBON	2.2K 5% 1/4W	
R306	1-259-161-21	CARBON	560 5% 1/4W	R375	1-259-183-11	CARBON	4.7K 5% 1/4W	
R307	1-259-143-21	CARBON	100 5% 1/4W	R376	1-249-490-11	CARBON	27K 5% 1/3W	
R308	1-259-191-21	CARBON	10K 5% 1/4W	R377	1-259-151-21	CARBON	220 5% 1/4W	
R309	1-249-844-11	CARBON	56K 1% 1/2W	R378	1-259-151-21	CARBON	220 5% 1/4W	
R310	1-259-320-11	CARBON	4.7K 1% 1/2W	△ R379	1-249-899-11	CARBON	100 5% 1/4W F	
R311	1-259-167-21	CARBON	1K 5% 1/4W	R380	1-247-749-11	CARBON	560 5% 1/2W	
R313	1-249-943-11	CARBON	6.8K 5% 1/4W	R381	1-249-496-11	CARBON	100K 5% 1/3W	
R314	1-249-198-11	CARBON	330 5% 1/3W	R382	1-259-171-21	CARBON	1.5K 5% 1/4W	
R315	1-249-198-11	CARBON	330 5% 1/3W	R383	1-259-167-21	CARBON	1K 5% 1/4W	
R316	1-249-198-11	CARBON	330 5% 1/3W	R384	1-259-239-11	CARBON	1M 5% 1/4W	
R317	1-249-198-11	CARBON	330 5% 1/3W	R385	1-259-143-21	CARBON	100 5% 1/4W	
R318	1-259-167-21	CARBON	1K 5% 1/4W	< VARIABLE RESISTOR >				
R319	1-259-151-21	CARBON	220 5% 1/4W	RV301	1-241-762-11	RES, ADJ, CARBON	2.2K	
R320	1-259-151-21	CARBON	220 5% 1/4W	RV351	1-241-762-11	RES, ADJ, CARBON	2.2K	
R321	1-259-151-21	CARBON	220 5% 1/4W	*****				
R322	1-259-215-21	CARBON	100K 5% 1/4W	* A-4398-160-A MAIN (B) BOARD, COMPLETE	*****			
R323	1-259-179-21	CARBON	3.3K 5% 1/4W	< CAPACITOR >				
R324	1-259-175-11	CARBON	2.2K 5% 1/4W	F	C401	1-136-163-00	FILM	0.068uF 5% 50V
R325	1-259-183-11	CARBON	4.7K 5% 1/4W		C402	1-136-163-00	FILM	0.068uF 5% 50V
R326	1-249-490-11	CARBON	27K 5% 1/3W		C403	1-109-871-11	ELECT	2700uF 20% 50V
R327	1-259-151-21	CARBON	220 5% 1/4W		C404	1-124-920-11	ELECT	330uF 20% 50V
R328	1-259-151-21	CARBON	220 5% 1/4W		C405	1-136-163-00	FILM	0.068uF 5% 50V
△ R329	1-249-899-11	CARBON	100 5% 1/4W	*****				
R330	1-247-749-11	CARBON	560 5% 1/2W	C406	1-126-923-11	ELECT	220uF 20% 10V	
R331	1-249-496-11	CARBON	100K 5% 1/3W	C407	1-136-157-00	FILM	0.022uF 5% 50V	
R332	1-259-171-21	CARBON	1.5K 5% 1/4W	C408	1-126-967-11	ELECT	47uF 20% 16V	
R333	1-259-167-21	CARBON	1K 5% 1/4W	C409	1-109-870-11	ELECT	8200uF 20% 50V	
R334	1-259-239-11	CARBON	1M 5% 1/4W	C411	1-126-969-11	ELECT	220uF 20% 50V	
R335	1-259-143-21	CARBON	100 5% 1/4W	C412	1-126-972-11	ELECT	1000uF 20% 50V	
R351	1-259-215-21	CARBON	100K 5% 1/4W	C413	1-126-960-11	ELECT	1uF 20% 50V	
R352	1-249-911-11	CARBON	330 5% 1/4W	C414	1-104-999-11	MYLAR	0.1uF 10% 200V	
R353	1-259-215-21	CARBON	100K 5% 1/4W	C415	1-126-025-11	ELECT	330uF 20% 25V	
R354	1-249-900-11	CARBON	110 1% 1/4W	C416	1-126-967-11	ELECT	47uF 20% 16V	
R355	1-259-161-21	CARBON	560 5% 1/4W	C417	1-126-964-11	ELECT	10uF 20% 50V	
R356	1-259-161-21	CARBON	560 5% 1/4W	C418	1-126-964-11	ELECT	10uF 20% 50V	
R357	1-259-143-21	CARBON	100 5% 1/4W	C419	1-164-077-11	CERAMIC	220PF 10% 50V	
R358	1-259-191-21	CARBON	10K 5% 1/4W	C421	1-137-150-11	MYLAR	0.01uF 10% 100V	
R359	1-249-844-11	CARBON	56K 1% 1/2W	C422	1-137-150-11	MYLAR	0.01uF 10% 100V	
R360	1-259-320-11	CARBON	4.7K 1% 1/2W	C430	1-126-965-11	ELECT	22uF 20% 50V	
R361	1-259-167-21	CARBON	1K 5% 1/4W	C451	1-136-163-00	FILM	0.068uF 5% 50V	
R363	1-249-943-11	CARBON	6.8K 5% 1/4W					
R364	1-249-198-11	CARBON	330 5% 1/3W					

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C452	1-136-163-00	FILM	0.068uF	5%	50V	▲R402	1-249-393-11	CARBON	10	5%	1/4W F
C453	1-109-871-11	ELECT	2700uF	20%	50V	▲R403	1-249-405-11	CARBON	100	5%	1/4W F
C454	1-124-920-11	ELECT	330uF	20%	50V	▲R404	1-249-405-11	CARBON	100	5%	1/4W F
C459	1-109-870-11	ELECT	8200uF	20%	50V	▲R405	1-247-745-11	CARBON	330	5%	1/2W F
C465	1-126-025-11	ELECT	330uF	20%	25V	▲R406	1-208-601-11	WIREWOUND	0.1	10%	2W F
C469	1-164-077-11	CERAMIC	220PF	10%	50V	▲R407	1-208-601-11	WIREWOUND	0.1	10%	2W F
< CONNECTOR >											
CN401	1-691-768-11	PLUG (MICRO CONNECTOR) 6P				R409	1-259-436-11	CARBON	2.2K	5%	1/6W
CN402	1-691-766-11	PLUG (MICRO CONNECTOR) 4P				R410	1-259-432-11	CARBON	1.5K	5%	1/6W
CN405	1-691-768-11	PLUG (MICRO CONNECTOR) 6P				R411	1-249-162-11	CARBON	10	5%	1/3W
CN406	1-564-506-11	PLUG, CONNECTOR 3P				R412	1-259-488-11	CARBON	330K	5%	1/6W
CN407	1-564-506-11	PLUG, CONNECTOR 3P				R413	1-259-452-11	CARBON	10K	5%	1/6W
* CN408	1-564-687-11	PIN, CONNECTOR 3P				R414	1-259-484-11	CARBON	220K	5%	1/6W
* CN403A	1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P				R415	1-259-460-11	CARBON	22K	5%	1/6W
CN404A	1-564-320-00	PIN, CONNECTOR (B2P-VH) 2P				R416	1-259-480-11	CARBON	150K	5%	1/6W
< DIODE >											
D403	8-719-024-99	DIODE 11ES2-NTA2B				R417	1-259-456-11	CARBON	15K	5%	1/6W
D404	8-719-024-99	DIODE 11ES2-NTA2B				R418	1-259-444-11	CARBON	4.7K	5%	1/6W
D405	8-719-024-99	DIODE 11ES2-NTA2B				R419	1-259-388-11	CARBON	22	5%	1/6W
D406	8-719-024-99	DIODE 11ES2-NTA2B				R420	1-259-468-11	CARBON	47K	5%	1/6W
D407	8-719-987-63	DIODE 1N4148M				▲R421	1-212-974-00	FUSIBLE	47	5%	1/2W F
D408	8-719-987-63	DIODE 1N4148M				R430	1-259-452-11	CARBON	10K	5%	1/6W
D409	8-719-024-99	DIODE 11ES2-NTA2B				R431	1-259-458-11	CARBON	18K	5%	1/6W
D410	8-719-024-99	DIODE 11ES2-NTA2B				▲R451	1-249-393-11	CARBON	10	5%	1/4W F
D411	8-719-024-99	DIODE 11ES2-NTA2B				▲R452	1-249-393-11	CARBON	10	5%	1/4W F
D412	8-719-302-38	DIODE RBV-602-01				▲R453	1-249-405-11	CARBON	100	5%	1/4W F
< GROUND TERMINAL >											
* EPT401	4-924-264-21	TERMINAL, MOUNT				▲R454	1-249-405-11	CARBON	100	5%	1/4W F
< IC >											
IC401	8-759-111-68	IC uPC1237HA				▲R455	1-247-745-11	CARBON	330	5%	1/2W F
< TRANSISTOR >											
Q401	8-729-104-18	TRANSISTOR 2SC3514-Q				▲R456	1-208-601-11	WIREWOUND	0.1	10%	2W F
Q402	8-729-104-91	TRANSISTOR 2SA1383				▲R457	1-208-601-11	WIREWOUND	0.1	10%	2W F
Q403	8-729-232-45	FET 2SK1529-Y				R459	1-259-436-11	CARBON	2.2K	5%	1/6W
Q404	8-729-232-46	FET 2SJ200-Y				R460	1-259-432-11	CARBON	1.5K	5%	1/6W
Q405	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA				R461	1-249-162-11	CARBON	10	5%	1/3W
Q407	8-729-140-96	TRANSISTOR 2SD774-34				R462	1-259-488-11	CARBON	330K	5%	1/6W
Q430	8-729-119-76	TRANSISTOR 2SA1175-HFE				*****					
Q451	8-729-104-18	TRANSISTOR 2SC3514-Q				< CONNECTOR >					
Q452	8-729-104-91	TRANSISTOR 2SA1383				CN701	1-564-510-11	PLUG (MICRO CONNECTOR) 6P			
Q453	8-729-232-45	FET 2SK1529-Y				CN703	1-564-505-11	PLUG, CONNECTOR 2P			
Q454	8-729-232-46	FET 2SJ200-Y				CN704	1-691-765-21	PLUG (MICRO CONNECTOR) 3P			
Q455	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA				< DIODE >					
Q456	8-729-281-54	TRANSISTOR 2SC1815-BL				D701	8-719-987-63	DIODE 1N4148M			
< RESISTOR >											
▲R401	1-249-393-11	CARBON	10	5%	1/4W F	< TRANSISTOR >					
R701	1-260-093-11	CARBON	330	5%	1/2W	Q701	8-729-900-63	TRANSISTOR DTA124ES			
R702	1-260-093-11	CARBON	330	5%	1/2W	Q702	8-729-142-36	TRANSISTOR BN1L3Z			
R703	1-260-103-11	CARBON	2.2K	5%	1/2W	< RESISTOR >					

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SP-SW

SP-TM

SW-F

VOL

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark					
R704	1-260-103-11	CARBON	2.2K	5%	1/2W	< CONNECTOR >								
		< RELAY >												
RY701	1-515-622-11	RELAY				< TRANSISTOR >								
		< SWITCH >												
S701	1-762-655-11	SWITCH, ROTARY SLIDE (SPEAKERS)												

*	1-665-580-11	SP-TM BOARD	*****			< RESISTOR >								
		< CONNECTOR >												
CN804	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P				R601	1-260-089-11	CARBON	150	5%	1/2W			
* CN808	1-564-321-21	PIN, CONNECTOR 2P				R602	1-260-089-11	CARBON	150	5%	1/2W			
* CN809	1-565-792-11	PIN, CONNECTOR 2P				R603	1-260-095-11	CARBON	470	5%	1/2W			
						R604	1-259-452-11	CARBON	10K	5%	1/6W			
						R605	1-259-452-11	CARBON	10K	5%	1/6W			
						< SWITCH >								
D501	8-719-987-63	DIODE 1N4148M				S601	1-762-656-11	SWITCH, ROTARY (TAPE MONITOR)						
		< FUSE >				S602	1-692-974-11	SWITCH, ROTARY (INPUT SELECTOR)						

△F801	1-532-464-51	FUSE, TIME-LAG (T2.5A/250V)				*	1-662-192-11	VOL BOARD	*****					
			< FUSE HOLDER >											
FH801	1-533-233-11	HOLDER, FUSE							< CONNECTOR >					
FH802	1-533-233-11	HOLDER, FUSE				CN201	1-691-770-11	PLUG (MICRO CONNECTOR) 8P						
			< COIL >						< RESISTOR >					
L501	1-411-906-11	COIL, AIR-CORE				R201	1-259-476-11	CARBON	100K	5%	1/6W			
L551	1-411-906-11	COIL, AIR-CORE				R251	1-259-476-11	CARBON	100K	5%	1/6W			
			< RESISTOR >			< VARIABLE RESISTOR >								
R501	1-249-162-11	CARBON	10	5%	1/3W	RV201	1-225-228-11	RES, VAR, CARBON 120K/120K (VOLUME)						
R502	1-247-750-11	CARBON	680	5%	1/2W	*****								
R551	1-249-162-11	CARBON	10	5%	1/3W	MISCELLANEOUS			*****					
R552	1-247-750-11	CARBON	680	5%	1/2W	△108	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)						
R710	1-249-429-11	CARBON	10K	5%	1/4W	110	1-506-113-00	SHORT PLUG						
			< RELAY >			△CNP801	1-777-185-11	CORD, POWER						
RY501	1-515-920-11	RELAY (24V)				△S1	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY)	(POWER)					
			< TERMINAL >			△T1	1-431-295-11	TRANSFORMER, POWER						

* TM501	1-537-519-11	TERMINAL BOARD (SPEAKER 8P) (BI WIRE SPEAKERS SYSTEM)				ACCESSORIES & PACKING MATERIALS			*****					

*	1-662-193-11	SW-F BOARD	*****			3-860-500-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SWEDISH, ITALIAN, PORTUGUESE, GERMAN)							
			< CAPACITOR >											
C601	1-136-165-00	FILM	0.1uF	5%	50V									
C602	1-136-165-00	FILM	0.1uF	5%	50V									
C603	1-126-926-11	ELECT	1000uF	20%	10V									

The components identified by
mark △ or dotted line with
mark △ are critical for safety.
Replace only with part number
specified.